REMARKS

Favorable reconsideration and allowance of the present patent application are respectfully requested. Claims 1-18 are pending in the application, with claims 12-17 being withdrawn from consideration.

Information Disclosure Statement

An Information Disclosure Statement and accompanying PTO-1449 form were filed on July 18, 2002. There is presently no indication that the Examiner considered the documents identified in that Information Disclosure Statement. Accordingly, the Examiner is respectfully requested to acknowledge consideration of the documents identified in that Information Disclosure Statement by initialing the PTO-1449 form and returning a copy of the initialed form to the undersigned.

Applicants note with appreciation the Examiner's consideration of, and making of record, the documents submitted with the Information Disclosure Statements filed on October 10, 2000 and September 7, 2001.

Allowable Subject Matter

Applicants note with appreciation the Examiner's indication on page 9 of the Office Action that claims 3-6 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and pending

the withdrawal of the 35 U.S.C. § 112, second paragraph rejections. For at least the reasons detailed below, Applicants respectfully submit that all pending claims are allowable.

Rejections under 35 U.S.C. § 112

The Examiner rejected claims 1-12 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter set forth therein. Each of the formalities identified in the Office Action have been addressed in this Amendment. Accordingly, Applicants request the Examiner to reconsider and withdraw this rejection.

The foregoing claim amendments to address the 35 U.S.C. §112, second paragraph were made to correct formalities such as grammatical errors and to place the present Application in better form for examination. Therefore, the foregoing amendments do not narrow the scope of the pending claims.

35 U.S.C. § 102 & 103 Rejections

Claims 1 and 2 were rejected under 35 U.S.C. § 103 (a) as allegedly being unpatentable over either *Okushko, V.A., et al.* 'Recording of double exposure holographic interferograms on photothermoplastic materials using residual memory,' Avtometriya Vol. 4 pp. 86-90 (1994) or *Panasyuk, et al.*, 'Process of double-exposure interferogram formation on deformed surface of thermoplastic media. SPIE vol. 2851,

pp. 150-157 (08/1996), in view of *Augostini* '885, *Bean et al.* '938 and *Schwertz* '698 combined with *Levine* '008 and *Bartfai* '643.

Claims 1, 2 and 7-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over either *Okushko, V.A., et al* or *Panasyuk, et al.* in view *Augostini* '885, *Bean et al.* '938 and *Schwertz* '698 combined with *Levine* '008 and *Bartfai* '643 and SU 1805445.

Claims 1, 2 and 7-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over either *Okushko, V.A., et al.* or *Panasyuk, et al.* in view of *Augostini* '885, *Bean et al.* '938 and *Schwertz* '698 combined with *Levine* '008 and *Bartfai* '643 and SU 1805445 and further in view of *Belonozhko, A.M., et al.* 'The control or erasure of holograms on thermoplastric carbozole containing polymeric semiconductors', Zh. Nauchn. Prikl. Fotogr. Kinematogr. Vol. 33(2) pp. 133-135 (1988).

Applicants respectfully traverse each of these rejections for at least the following reasons.

Applicants respectfully submit that each of the multitude of cited references, either alone or in combination (which combination Applicants do not admit to), fail to teach or suggest the combination of elements as recited in the claims of the present invention, in particular as recited independent claim 1. Furthermore, and as discussed further below, one skilled in the art would not combine the cited references. Thus, Applicants respectfully submit that the Examiner failed to establish a *prima facie* case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all the claim limitations, see *In re Vaeck*, 947 F.2d 48, 20 USPQ2d 1438 (Fed.Cir.1991).

Furthermore, Applicants fail to understand the motivation to combine the references, and how the Examiner is applying each reference. MPEP 706.02(j) recites in pertinent part that "the examiner should set forth in the Office action...the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate." Additionally, the mere identification of claim features in disparate references does not establish the requisite realistic motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103. *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). Rather, a burden is imposed upon the Examiner to identify a source in the applied prior art for each claim limitations and identify a source for the requisite realistic motivation to modify a particular reference in a particular manner to arrive at a specifically claimed invention. *Smiths Industries Medical System v. Vital Signs Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999); *In re Mayne*, 104 F.3d 1339, 41 USPQ2d 1451 (Fed. Cir. 1997).

Applicants are unable to understand how the Examiner is applying each of the

cited references, nor the requisite motivation for combing the cited references. The Examiner merely states on page 6 of the Office Action that "[t]he number of references serve to establish the well known character of these aspects of the claimed invention and provide additional motivation for the combination of these features." MPEP 707(g), states that "[a rejection] should be stated with the full development of reasons rather than by a mere conclusion coupled with some stereotyped expression."

Furthermore, it has been repeatedly held by the Court of Appeals for the Federal Circuit that in order to establish the requisite motivation, the Examiner must make "clear and particular" factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify a particular prior art reference to arrive at the claimed invention based upon facts, not generalizations. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolochem Inc. v. Southern California Edison, Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab*, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); *In re Dembiczak,* 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). In doing so, the Examiner must provide facts and explain why one having ordinary skill in the art would have been realistically motivated to modify the method of forming optical holograms disclosed by either *Okushko*, V.A. et al. or *Panasyuk* et al. to arrive at the claimed invention. *Ecolochem Inc. v. Southern California Edison, Co.*, supra.; *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

Therefore, the conclusionary motivation statement asserted by the Examiner,

that "[t]he number of references serve to establish the well known character of these aspects of the claimed invention and provide additional motivation for the combination of these features," fails to substantiate an obviousness rejection.

Additionally, the Examiner has not shown that the combination of prior art references teaches or suggests all the claim limitations, as is required in order to establish a *prima facie* case of obviousness. In rejecting independent claim 1, it appears, insofar as understood by Applicants, that the Examiner is relying on *Aguostini*, *Bean*, *Schwertz*, *Bartfai* and *Levine* to allegedly teach an erasure process, as identified in items 5 and 6 below; and either *Okushko*, V.A. et al. or *Panasyuk* et al. to allegedly teach or suggest at least items 1, 2, 3, and 4 (identified below), as recited in independent claim 1.

As such, Applicants submit that *Okushko*, V.A. et al. or *Panasyuk* et al. fails to teach or suggest, either alone or in combination (which combination, Applicants do not admit to) at least the method steps of:

1.) charging a surface of the AMS-film by a corona discharge, wherein the surface of the AMS-film is charged at a maximum allowable corona discharge current that the AMS-film can withstand before the film surface becomes destroyed by the positive ion bombardment, and the charging is continued up to the highest achievable potential before local breakdowns begin to occur, in order to achieve the maximum signal to noise ratio in the holographic image, which increases the number of operation cycles the AMS-film can withstand without loss of quality in

hologram recordings;

2.) reducing the electron and hole components of the dark conductivity of the AMS-film by pulse heating the AMS-film when it has reached the operating surface potential, in order to increase resolution and holographic sensitivity of the AMS-film;

3.) initiating the heating of the AMS-film for developing the electrostatic image into a geometrical relief at the optimal start temperature and heating the AMS-film at an optimal heating rate, in order to additionally increase the resolution and holographic sensitivity of the AMS-film, up to optimum reproducible levels;

4.) creating a latent electrostatic image of a desired holographic image of an object on the surface of the AMS-film, developing the latent electrostatic image into a geometrical relief at the surface of the AMS-film, and restricting the development of the geometric relief by a pre-set value of a diffraction efficiency of the holographic image;

5.) erasing the AMS-film for recording additional holograms and illuminating the AMS-film by a flash lamp simultaneously with the heating of the film during the erasing process such that bulk and surface charges of the AMS-film are removed, in order to increase the number of recording cycles the AMS-film can withstand before holographic sensitivity is reduced to a level at which the AMS-film must be replaced and in order to reduce the erasing time and temperature of the AMS-film; and

6.) restricting the erasing process by a pre-set value of the diffraction efficiency.

Okushko, V.A. et al. is directed to the recording of double-exposure holographic interferrogramms using residual memory. *Okusho*, V.A. et al. teaches specifically that "after thermal erasure the relief hologram can be reconstructed again without repetition of the original exposure," see abstract. Applicants respectfully submit that *Okusho*, V.A. et al. teaches away from the claimed invention. Independent claim 1, of the present application, recites that during the erasing process, the bulk and surface charges of the AMS-film are removed. One skilled in the art can appreciate that the present invention removes the bulk and surface charges, so that the AMS-film is then a "clean slate." Therefore, one skilled in the art would not look towards *Okusho*, V.A. et al., which obviously does not remove all of the bulk and surface charges so that a duplicate hologram can be reconstructed, in order to find the teachings of the present invention, because *Okusho*, V.A. et al. teaches away from the claimed invention and also does not teach or suggest all of the claim limitations, as indicated above.

Panasyuk et al. is directed to the process of relief formation during the recording of double-exposure interferograms on a photothermoplastic carrier (PTPC). *Panasyuk* et al., however, also fails to teach that above indicated items. In particular, *Panasyuk* et al. fails to teach or suggest that the surface of the PTPC carrier is charged at a maximum allowable corona discharge; that the electron and hole components of the dark conductivity are reduced by pulse heating the PTPC carrier when it has reached

an operating surface potential; or that the development of a geometric relief is restricted by a pre-set value of a diffraction efficiency of the holographic image, as recited in independent claim 1.

Even assuming *in arguendo* that the combination of either *Aguostini*, *Bean*, *Schwertz*, *Bartfai* or *Levine* could be combined with either *Okushko*, V.A. et al. or *Panasyuk* et al., which Applicants do not admit, *Aguostini*, *Bean*, *Schwertz*, *Bartfai* or *Levine*, alone or in combination, would still fail to make up for the previously mentioned deficiencies.

Additionally, neither *Aguostini*, *Bean*, *Schwertz*, *Bartfai* or *Levine* teach or suggest at least that the erasing process is restricted by a pre-set value of a diffraction efficiency, as recited in independent claim 1.

Therefore, in view of the above discussion, the Examiner has failed to establish *prima facie* obviousness in rejecting each of the claims. Accordingly, withdrawal of the rejections is respectfully requested.

Lastly, added claim 18 is a dependent claim, which should be considered allowable at least for depending from an allowable base claim.

Conclusion

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance and such allowance is respectfully solicited. Should there be any outstanding matters that

need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the below listed telephone number, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicants respectfully petition for a three (3) month extension of time for filing a reply in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Response.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1. 17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made
Request for Initialed PTO-1449 Form dated 7/18/02

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows:

1. (Once amended) A [Method] method for [performing registration of] forming optical holograms on an amorphous molecular semiconductor (AMS) film deposited on a [glass substrate which is pre-covered with an electric] transparent conducting sub-layer, [where] the method steps for the formation of a [hologram] holographic image [comprises] comprising:

charging [the] a surface of the AMS-film by a corona discharge, wherein the surface of the AMS-film is charged at a maximum allowable corona discharge current that the AMS-film can withstand before the film surface becomes destroyed by the positive ion bombardment, and the charging is continued up to the highest achievable potential before local breakdowns begin to occur, in order to achieve the maximum signal to noise ratio in the holographic image, which increases the number of operation cycles the AMS-film can withstand without loss of quality in hologram recordings;

reducing the electron and hole components of the dark conductivity of the AMS-film by pulse heating the AMS-film when it has reached the operating surface potential, in order to increase resolution and holographic sensitivity of the AMS-film;

initiating the heating of the AMS-film for developing the electrostatic image into a geometrical relief at the optimal start temperature and heating the AMS-film at an optimal

heating rate, in order to additionally increase the resolution and holographic sensitivity of the AMS-film, up to optimum reproducible levels;

creating a latent electrostatic image of [the] a desired holographic image [hologram] of [the] an object on the surface of the AMS-film;[,]

developing the latent electrostatic image into a geometrical relief at the surface of the AMS-film;[,]

restricting the development of the geometric relief by a pre-set value of [the] a diffraction efficiency of the [restored] holographic image;[,]

[resetting] erasing the AMS-film for [new registrations] recording additional holograms;[, and]

illuminating the AMS-film by a flash lamp simultaneously with the heating of the film during the erasing process such that bulk and surface charges of the AMS-film are removed, in order to increase the number of recording cycles the AMS-film can withstand before holographic sensitivity is reduced to a level at which the AMS-film must be replaced and in order to reduce the erasing time and temperature of the AMS-film; and

restricting the erasing process by a pre-set value of the diffraction efficiency[,]

[characterised in that it comprises:]

[- charging the surface of the AMS-film at a maximum allowable corona discharge current that the AMS-film can withstand before the film surface becomes destroyed by the positive ion bombardment, and continuing the charging up to the highest achievable potential before local breakdowns begin to occur, in order to achieve the maximum signal

to noise ratio in the restored holographic image and to increase the number of operation cycles the AMS-film can withstand without loss of quality in the hologram recordings,]

[- reducing the electron and hole components of the dark conductivity of the AMS-film by pulse heating the film when it has reached the operating surface potential, in order to increase the resolution and holographic sensitivity of the AMS-film,]

[- initiating the heating of the AMS-film for developing the electrostatic image into a geometrical relief at the optimal start temperature and heating the AMS-film at an optimal heating rate, in order to additionally increase the resolution and holographic sensitivity of the AMS-film up to the optimum reproducible levels, and]

[- illuminating the AMS-film by a flash lamp simultaneously with the heating of the film during the erasing process such that bulk and surface charges of the film is removed, in order to increase the number of recording cycles the film can withstand before the film's holographic sensitivity is reduced to a level at which the film must be replaced, and in order to reduce the erasing time and temperature].

2. (Once Amended) The [M]method according to claim 1, [characterised in that] wherein, when the method is [to be] applied for double exposure holographic interferometry, the development of the latent electrostatic image of [the] a first exposure [comprises to] converts the latent electrostatic image into a latent image[, a so-called] such as a photo-electret image, by pulse heating the AMS-film by applying a pulsating electric current on the [electric] transparent conducting sub-layer and [by] subsequently

illuminating the AMS-film by a flash-lamp followed by recharging the surface of the AMS-film [up] to [it's] an initial operating surface potential.

3. (Twice Amended) The [M]method according to claim 1, [characterised in that] wherein the AMS-film [consists] comprises [of] 92 wt% of a copolymer comprising N-epoxypropylcarbazole and 5 wt% buthylglycedil ether, doped with 5 wt% of methyl-9-(4-dodecyl-oxyphenyl-l,3-selenathiol-2-ylidene)-2,5,7-trinitrofluorene-4-carboxylate and 4 wt% of hexadecyl-2,7-dinitro-dicyanomethylenfluorene-4-carboxylate.

4. (Once Amended) The m[M]ethod according to claim 1 [3], [characterised in that] wherein the starting temperature of the heating of the AMS-film, during development of the latent electrostatic image, is preferably within the range from 15 to 40°C[, and that the optimal starting temperature is 36°C].

5. (Once Amended) The m[M]ethod according to claim [4] 1, [characterised in that] wherein the heating rate of the AMS-film, during development of the latent electrostatic image, is [preferably] in the order of 10^6 °C/sec.

6. (Twice Amended) The m[M]ethod according to claim [3] 1, [characterised in that] wherein, [the] when the temperature of the AMS-film is within the range from 15 to

40°C, the optimum charging potential of the film surface is 125 V/μm and the maximum charging current is 1 $\mu A/cm^2$[, respectively].

7. (Twice Amended) The m[M]ethod according to claim 1, [characterised in that] wherein the diffraction efficiency is measured with a photo-sensor installed in [the] zero[th] diffraction order.

8. (Twice Amended) The [M]method according to claim 7, [characterised in that] wherein the heating of the AMS-film, during development of the latent electrostatic image [or photo-electret image of a hologram] into a geometrical relief at the [film] surface of the AMS-film, is terminated when the measured diffraction efficiency reaches a pre-set value in the range of 0.005-30% or if the time derivative of the measured diffraction efficiency reaches a termination condition.

9. (Once Amended) The [M]method according to claim [8] 2, [characterised in that] wherein, [-] when the latent electrostatic image is developed into a photo-electret image, the pulse pre-heating of the AMS-film is terminated when the measured diffraction efficiency of the restored holographic image reaches a pre-set value of 0.05%, and [-] when the geometrical relief at the film surface, which corresponds to the developed image of the hologram, becomes erased in order to reset the AMS-film, the heating of the AMS-film is terminated when the measured diffraction efficiency of the restored

holographic image reaches a pre-set value of 0.01 %.

10. (Twice Amended) The [M]method according to claim 8, [characterised in that] wherein the termination condition is either [that] when the calculated time derivative of the measured diffraction efficiency changes sign from a positive to a negative value or [if] when the absolute value of the time derivative of the measured diffraction efficiency becomes less than a threshold value which is close to zero.

11. (Once Amended) The [M]method according to claim 9, [characterised in that] wherein the photo-electret image has a lifetime of up to 20 hours.

12. (Once Amended) The [M]method according to claim 9, [characterised in that] wherein the AMS-film achieves a holographic sensitivity of up to 1650 m^2/J, a resolution of up to 1700 mm^{-1}, and a signal-to-noise ratio[n of] up to 125.

Claim 18 has been added.